Two-Digit Subtraction With And Without Regrouping

Brief Overview:

During the course of the three-day lessons, students will use manipulatives as well as mental math to determine the mathematical difference between two-digit basic whole numbers with and without regrouping. Students will first review subtracting single digit numbers using manipulatives. As the week progresses, students will use mental math and alternative strategies to finding the difference between two-digit whole numbers.

NCTM Content Standard/National Science Education Standard:

- **Knowledge of number relationships and computation/arithmetic.**
- **Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools.**
- **Recognize equivalent representations for the same number and generate them by decomposing and composing numbers**

Grade/Level:

2nd grade

Duration/Length:

3-4 days including assessment /75 minutes each day.

Student Outcomes:

Students will:

- **Review number relations in order to determine the difference of two-digit basic whole numbers without regrouping.**
- **Use mathematical manipulatives such as base ten blocks and place value work mats in order to determine the difference of two-digit basic whole numbers.**
- **Apply subtraction with and without regrouping in order to determine the difference of two-digit basic whole numbers.**

Materials and Resources:

Lesson 1
- **Place Value Workmat**
- **Student Resource 1, Hundreds Chart**
- **Visualizer/Overhead (transparency)**
- **Read-Aloud, <u>Shark Swimathon</u> By Stuart J. Murphy (MathStart Series-Subtracting Two-Digit Numbers)**
- **Reteaching Worksheet**
- **Transparency of Student Resource 1, Hundreds Chart**
- **Student Resource 1, Hundreds Chart (one per student)**
- **Student Resource 2, Subtract Tens on a Hundreds Chart (one per student)**
- **Teacher Resource 1, Subtract Tens on a Hundreds Chart Answer Key**

Lesson 2
- **Base Ten Blocks (tens and ones)**
- **Place Value Workmat**
- **Visualizer/Overhead (transparency)**
- **Two transparencies**
- **Dry erase markers/paper towel**
- **Overhead Base Ten Blocks**
- **Teacher Resource 2, Regroup Subtraction Answer Key**
- **Student Resource 3 – Regroup Subtraction (one per student)**

Lesson 3
- **Base Ten Blocks (tens and ones) * if necessary**
- **Student choice of two different crayons/colored pencils**

- **Teacher Resource 3 – Regrouping Answer Key**
- **Student Resource 4- Regrouping (one per student)**

Development/Procedures:

Lesson 1 **Shark Swimathon**

Pre-Assessment (5 minutes)

- **Read aloud Shark Swimathon pgs. 4-13.**
- **Provide the place value work mat.**
- **Display the problem 75-14= on the visualizer.**

Launch (10 minutes)

- **Ask the students: "In the number 75, what place is the 5 in? "The five is in the ones place.")**
- **Ask the students: "In the number 75, what place is the 7 in? ("The seven is in the tens place.")**
- **Ask the students: "In the number 14, what place is the four in? ("The four is in the ones place.")**
- **Ask the students: "In the number 14, what place is the one in? ("The one is in the tens place.")**
- **Have students write the problem 75-14 on their place value work mat.**
- **Distribute Student Resource 1, Hundred Charts to the students.**

Teacher Facilitation (10 minutes)

- **Model how to subtract tens without regrouping using a hundred-chart transparency.**
- **Ask the students: "What number do we point to first on our hundred chart to solve the problem 75-14?" ("75").**

- **Ask the students: "What number am I subtracting from 75?" "In order to subtract 14, how many spaces do we move up on the hundred chart? ("We move up one space.")**
- **Ask the students: "On what number do you land?" ("65").**
- **Ask the students: "Which direction do we need to move in order to subtract 4 on the hundreds chart? (left) "How many spaces do we move to the left on the hundred chart starting with the number 65?" ("4").**
- **Ask the students, "On what number do you land?" ("61").**

Student Application (30 minutes)

- **Distribute Student Resource 2, Subtract Tens on a Hundreds Chart.**
- **Have students continue to work independently on Student Resource Sheet 2 at their desk.**
- **Model another problem such as 55-15.**
- **Ask the students: "What number do we point to first on our hundred chart?"("55").**
- **Ask the students: "Do we move up or down on our hundred chart?" ("We move up on the hundred chart.")**
- **Ask the students: "Why do we move up on the hundred chart?" ("Because we are subtracting").**
- **Ask the students; "On what number do you land?" ("45").**
- **Ask the students: "Do we move to the left or right on our hundred chart?" ("We move to the left on the hundred chart.")**
- **Ask the students: "Why do we move to the left on the hundred chart?" ("Because we are subtracting").**
- **Ask the students: "On what number do you land?" ("40").**

Embedded Assessment (10 minutes)

- **Assess students' completion of Student Resource Sheet 2, Subtract Tens on a Hundreds Chart.**

Re-teaching/Extension (10 minutes)

- **Reteaching- Take a small group of students who did not fully grasp the concept to review Student Resource 2 adding additional examples as necessary.**
- **Students who have a clear grasp of the concept, may pair with a partner to quiz them on additional problems that can be solved using hundreds chart subtraction.**

Lesson 2
Pre-Assessment (5 minutes)

- **Ask: Does anyone know what Regrouping is? What does finding the difference mean? Go over the definition with students.**
- **Display 67-13 on the board.**
- **Ask: What place do we subtract first? (The ones place.)**
- **What are those digits? (7 – 3)**
- **Do we have to regroup? Yes or No? Why or Why not? (7 is greater than 3, so we don't have to regroup.)**
- **What is the difference? (4)**
- **What place value are we going to subtract next? (We're going to subtract the digits in the tens place.)**
- **What are those digits? (6 – 1)**
- **Do we have to regroup? Yes or No? Why or Why not? (We don't have to regroup because 6 is greater than 1)**
- **What is the difference? (5)**

Launch (20 minutes)
- **Distribute Base Ten Blocks to students in baggies.**
- **Remind students how to use manipulatives while working with a partner.**
- **On a transparency write 84 – 17. (Answer is 67.)**
- **Model how to regroup with Overhead Base Ten Blocks.**
- **Have students take out 8 tens and 4 ones. What number does this represent? (84)**
- **Monitor student progress.**
- **How can we find the difference in 84 – 17?**

- **What place do we subtract first? (We subtract from the ones place.)**
- **How many ones are you subtracting? (7) Do we have 7 ones to take away? (No)**
- **Do we have to regroup? (Yes). Why? (We have to regroup because 4 is less than 7). How can we do that?**
- **Model with Base Ten Blocks the removal of 1 ten from the tens place and exchanging it for 10 ones in the ones place. Add. 10 + 4 = 14. Now that we regrouped the digits on the ones place, can we subtract 14 – 7? (Yes) What is the difference? 7**
- **Explain that because we regrouped, we have to go backwards one digit to represent what we subtracted from the tens place. 8 – 1 becomes 7 – 1. What is the difference for 7 – 1? (6).**
- **Check for understanding.**
- **Re-bag manipulatives**

Teacher Facilitation (30 minutes)
- **Solve problem, 84 – 17. Remind students that they need to find the difference. Review number sentence. 84 - 17 on Visualizer/Overhead (transparency)**
- **Review skills taught in yesterday's lesson of subtracting on a hundreds chart.**
- **Students will write the problem 84-17 on work mat (Student Resource 1)**
- **Do we have to regroup? Yes or No? Why or Why not?**
- **Model how to regroup with Overhead Base Ten Blocks.**
- **Students repeat same process. Ask: Does anyone have questions? If not, continue lesson. If so, take those students later for a re-teaching lesson in small group.**
- **Monitor progress.**
- **Students can use hundreds chart, mental math, and base ten blocks to solve the problem.**

Student Application (10 minutes)

- **Students will work on the problem independently using place value work mat and base ten blocks. (Student Resource 3, Regroup Subtraction)**

Embedded Assessment

- **Review students' completion of Student Resource 3.**

Re-teaching/Extension (10 minutes)

- **Review Student Resource 3 for re-teaching lesson in small groups as necessary with students who have difficulty grasping the concept. Additional problems should be provided as needed.**
- **For early finishers, complete three two digit problems written on the board such as: 75-18, 45-17, 35-18**
- **Students may also visit the website www.eduplace.com. (Extra Practice Section– Unit 5 Subtracting Two-Digit Numbers) for additional practice.**

Lesson 3

Pre-assessment (5 minutes)

- **Write the problem, 73-37, on the board.**
- **Ask a volunteer to demonstrate using overhead base ten blocks how to solve the problem.**
- **Ask the rest of the class if they agree with the way the student solved the problem and why he/she solved it the way they did.**

Launch/Teacher Facilitation

- **Ask students the following question: How do you solve 86 – 18?**
- **Have students make 86 with Base Ten Blocks.**
- **Ask students: How can I illustrate the two-digit number 86?**
- **Guide students to draw 8 lines and 6 dots.**
- **Repeat same process for two-digit number, 18.**
- **Do you have to regroup? Yes or No? (YES)**

- Why do you have to regroup? (We have to regroup because 6 is less than 8.)
- Model how to take 1 ten from the tens place and exchange it for 10 ones. (Use transparency and illustrate regrouping)
- "How many tens do you have left?" (7 tens)
- "How many ones do you have now?" (16 ones)
- "Can we now subtract?" (yes)
- "What numbers do you subtract in the ones column?" (16-8)
- "What numbers do you subtract in the tens column?" (7-1)
- "What is the answer?" (68)

Tens	Ones
8	6
-1	8

Tens	Ones

- Illustrate Two-Digit Subtraction problem with regrouping using the diagram above.

Student Application
- Allow the students to work in three different mathematical groups.
- Students in group one will work with the teacher using base ten blocks to subtract two problems with regrouping.
- Students in group two will work with a regrouping subtraction center using base ten blocks. At the center students will receive a bag of 30 index cards with a combination of different subtraction problems. The partners will be required to solve the problems using base ten blocks on a separate piece of paper.
- Students in group three will work on Student Resource 4 independently.

Embedded Assessment
- Students will think of four subtraction problems that involve regrouping and record them in their journals.

- **The students can use base ten blocks or solve the problem using the illustrated model.**

Re-teaching/Extension
- **Re-teach: Provide guidance and problems to solve for students who need additional support.** You may find that students need an additional day with the concept of subtraction with regrouping to fully understand the concept.

Summative Assessment:

- **Have students complete Selective Response and a Brief Constructed Response (BCR); Student Resource Version 4.**

Appendix A: Teacher Resources

- **Teacher Resource 1: Subtract Tens on a Hundreds Chart**
- **Teacher Resource 2: Regroup Subtraction 1**
- **Teacher Resource 3: Regroup Subtraction 2**
- **Teacher Resource 4: Regrouping**
- **Teacher Resource 5: Summative Assessment**

Appendix B: Student Resources

- **Student Resource 1: Hundreds Chart**
- **Student Resource 2: Subtract Tens on a Hundreds Chart**
- **Student Resource 3: Regroup Subtraction 1**
- **Student Resource 4: Regroup Subtraction 2**
- **Student Resource 5: Regrouping**
- **Student Resource 6: Summative Assessment**

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Subtract Tens on a Hundreds Chart

Use the hundreds chart. **Remember** Subtract. Move up 1 row for each ten you subtract.

1. 34 – 10 = <u>24</u>

2. 25 – 20 = <u>5</u>

3. 41 – 30 = <u>11</u>

4. 53 – 20 = <u>33</u>

5. 85 – 30 = <u>55</u>

6. 49 – 30 = <u>19</u>

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

7. 74 - 40 34	8. 50 -40 10	9. 89 -10 79	10. 75 - 60 15
11. 82 -10 72	12. 61 - 20 41	13. 42 - 30 12	14. 88 - 40 48

Selected Response:
Darken in the correct answer.

15. Which problem do you have to subtract a ten?
   A. 24 – 5
   B. 28 – 03
   C. 72 – 30
   D. 22 – 2

<u>Regroup Subtraction 1</u>

Do you need to regroup? Circle yes or no. Put in vertical form and find the difference.

1. Subtract: 34-16   **Do you need to regroup?**   **What is the difference?**
                                <u>Yes</u> **or No**   ___18_

2. Subtract: 25-16   **Do you need to regroup?**   **What is the difference?**
                                <u>Yes</u> **or No**   ___9_

3. Subtract: 41-19   **Do you need to regroup?**   **What is the difference?**
                                <u>Yes </u> **or No**   __22__

4. Subtract: 54-27   **Do you need to regroup?**   **What is the difference?**
                                <u>Yes </u> **or No**   ___27_

5. Subtract: 67-18   **Do you need to regroup?**   **What is the difference?**
                                <u>Yes</u> **or No**   __49__

6. Subtract: 78-19   **Do you need to regroup?**   **What is the difference?**
                                <u>Yes</u> **or No**   ___59_

7. Subtract: 77-29   **Do you need to regroup?**   **What is the difference?**
                                <u>Yes</u> **or No**   ___48_

8. Subtract: 45-16   **Do you need to regroup?**   **What is the difference?**
                                <u>Yes</u> **or No**   _____29___

<u>Regroup Subtraction 2</u>

Do you need to regroup? Circle yes or no. Put in vertical form and find the difference.

1. Subtract: 86-18   **Do you need to regroup?**   **What is the difference?**
                                           <u>Yes</u> **or No**   __68__

2. Subtract: 28-19   **Do you need to regroup?**   **What is the difference?**
                                           <u>Yes</u> **or No**   __9__

3. Subtract: 44-17   **Do you need to regroup?**   **What is the difference?**
                                           <u>Yes</u> **or No**   ___27_

4. Subtract: 73-15   **Do you need to regroup?**   **What is the difference?**
                                           <u>Yes</u> **or No**   __58__

5. Subtract: 61-13   **Do you need to regroup?**   **What is the difference?**
                                           <u>Yes</u> **or No**   __48__

6. Subtract: 55-16   **Do you need to regroup?**   **What is the difference?**
                                           <u>Yes</u> **or No**   __39__

7. Subtract: 24-19   **Do you need to regroup?**   **What is the difference?**
                                           <u>Yes</u> **or No**   ___5__

Tens	Ones
[6] 7	[15] 5
−1	6

Tens	Ones
||| |||	• • • • • • • • • • • • • • •
− |	• • • • • •
| | | | | |	• • • • • • • •

Tens	Ones
2 [1] − 1	5 [15] 7

Tens	Ones
|	• • • • • • • • • • • • • •
− |	• • • • • • •

Tens	Ones
3 [2] − 1	6 [16] 7

Tens	Ones
| |	• • • • • • • • • • • • • • • •
− |	• • • • • • •

Summative Assessment
Selected Response

SR Question: What is the difference? 56-18 =

A. 38

B. 48

C. 28
D. 34

Brief Constructed Response

Step A
Look at the following problem 38 - 19. Do you have to regroup?
Yes or No?   yes

_____

Step B
Use what you know about mathematical concepts to explain why your answer is

correct. Use words and/or numbers in your explanation. Students may include:

- **Drawing showing tens and ones**
- **Traditional regrouping algorithm**
- **Explain that ones can't be taken from ones**
- **Explain using subtraction on 100's chart**

Hundreds Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Subtract Tens on a Hundreds Chart

Use the hundreds chart. **Remember** Subtract. Move up 1 row for each ten you subtract.

1. 34 – 10 = _____

1. 25 – 20 = _____

2. 41 – 30 =_____

3. 53 – 20 = _____

4. 85 – 30 = _____

5. 49 – 30 =_____

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

7.   74
    - 40
	8. 50
	    -40
		9. 89
		    -10
			10. 75
			    - 60

11.   82
    -10
	12. 61
	    - 20
		13. 42
		    - 30
			14. 88
			    - 40

Selected Response:
Darken in the correct answer.

15. Which problem do you have to subtract a ten?
    A. 24 – 15
    B. 28 – 03
    C. 72 – 30
    D. 22 – 2

Regroup Subtraction 1

Do you need to regroup? Put in vertical form and find the difference.

1. Subtract: 34-16   **Do you need to regroup?**   **What is the difference?**
Yes or No   ____

2. Subtract: 25-16   **Do you need to regroup?**   **What is the difference?**
Yes or No   ____

3. Subtract: 41-19   **Do you need to regroup?**   **What is the difference?**
Yes or No   ____

4. Subtract: 54-27   **Do you need to regroup?**   **What is the difference?**
Yes or No   ____

5. Subtract: 67-18   **Do you need to regroup?**   **What is the difference?**
Yes or No   ____

6. Subtract: 78-19   **Do you need to regroup?**   **What is the difference?**
Yes or No   ____

7. Subtract: 77-29   **Do you need to regroup?**   **What is the difference?**
Yes or No   ____

8. Subtract: 45-16   **Do you need to regroup?**   **What is the difference?**
Yes or No   ____

<u>Regroup Subtraction 2</u>

Do you need to regroup? Circle yes or no. Put in vertical form and find the difference.

1. Subtract: 86-18   **Do you need to regroup?**   **What is the difference?**
                          Yes or No   ____

2. Subtract: 28-19   **Do you need to regroup?**   **What is the difference?**
                          Yes or No   ____

3. Subtract: 44-17   **Do you need to regroup?**   **What is the difference?**
                          Yes or No   ____

4. Subtract: 73-15   **Do you need to regroup?**   **What is the difference?**
                          Yes or No   ____

5. Subtract: 61-13   **Do you need to regroup?**   **What is the difference?**
                          Yes or No   ____

6. Subtract: 55-16   **Do you need to regroup?**   **What is the difference?**
                          Yes or No   ____

7. Subtract: 24-19   **Do you need to regroup?**   **What is the difference?**
                          Yes or No   ____

Tens	Ones
7	5
- 1	6

Tens	Ones
-	

Tens	Ones
2	5
-1	7

Tens	Ones
-	

Tens	Ones
3	6
- 1	7

Tens	Ones
-	

Tens and Ones Chart

Tens	Ones

Summative Assessment
Selected Response

SR Question: What is the difference? 56-18 =

   A. 38
   B. 48
   C. 28
   D. 34

Brief Constructed Response

Step A

Look at the following problem 38 - 19. Do you have to regroup?
Yes or No?

_____

Step B

Use what you know about mathematical concepts to explain why your

answer is correct. Use words and/or numbers in your explanation.

_____

_____

_____

_____

_____

Summative Assessment
Selected Response
SR Question: What is the difference? 56-18 =

   E. 38
   F. 48
   G. 28
   H. 34

Brief Constructed Response

Step A
Look at the following problem 38 - 19. Do you have to regroup?
Yes or No?

_____

Step B
Use what you know about mathematical concepts to explain why your

answer is correct. Use words and/or numbers in your explanation.

_____

_____

_____

_____

_____